

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 March 2002 (28.03.2002)

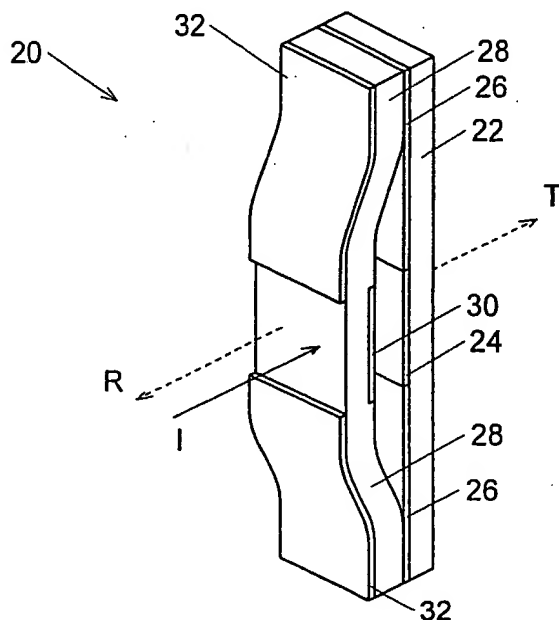
PCT

(10) International Publication Number
WO 02/025348 A3

- (51) International Patent Classification: G02B 26/02, G01J 3/26
- (21) International Application Number: PCT/US01/28694
- (22) International Filing Date:
14 September 2001 (14.09.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
09/664,020 19 September 2000 (19.09.2000) US
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR INTERFEROMETRIC MODULATION OF LIGHT



(57) Abstract: An interferometric light modulator includes a base and a ribbon suspended above the base. The ribbon has a central region and first and second conducting regions located outside of the central regions. The base includes a second mirror located parallel and adjacent to the first mirror so that the first and second mirrors form an interferometric cavity. An electrical bias applied to the first and second conducting regions adjusts the interferometric cavity in order to modulate light which is incident upon the central region of the ribbon. In an alternative interferometric light modulator, the light is incident upon a second central region of the base.

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(88) Date of publication of the international search report:
13 March 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

PCT/US 01/28694

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G02B26/02 G01J3/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 G02B G01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 835 255 A (MILES MARK W) 10 November 1998 (1998-11-10) cited in the application	1-7,9, 11-21
Y	column 13, line 25 - line 64 column 17, line 66 - column 18, line 6 column 19, line 56 - line 60 figure 20	8,10
Y	WO 99 34484 A (CORETEK INC) 8 July 1999 (1999-07-08) page 10, paragraph 1	8,10
A	US 4 859 060 A (HIJIKIGAWA MASAYA ET AL) 22 August 1989 (1989-08-22) column 11, line 17 - line 25	1,16,17

☐ Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search

2 December 2002

Date of mailing of the international search report

11/12/2002

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Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 5835255	A	10-11-1998	EP	0801766 A1	22-10-1997
			JP	10500224 T	06-01-1998
			US	2002054424 A1	09-05-2002
			US	2002149828 A1	17-10-2002
			US	2002126364 A1	12-09-2002
			WO	9530924 A1	16-11-1995
			US	6055090 A	25-04-2000
			US	6040937 A	21-03-2000
			US	5986796 A	16-11-1999
			US	2002015215 A1	07-02-2002
			US	2002075555 A1	20-06-2002
WO 9934484	A	08-07-1999	US	2002031155 A1	14-03-2002
			AU	2017499 A	19-07-1999
			CA	2316858 A1	08-07-1999
			CN	1285034 T	21-02-2001
			EP	1053574 A2	22-11-2000
			JP	2002500446 T	08-01-2002
			WO	9934484 A2	08-07-1999
			US	2002061042 A1	23-05-2002
US 4859060	A	22-08-1989	JP	1755324 C	23-04-1993
			JP	4046369 B	29-07-1992
			JP	62257032 A	09-11-1987
			JP	62265545 A	18-11-1987
			JP	62126303 A	08-06-1987
			JP	1707430 C	27-10-1992
			JP	3075801 B	03-12-1991
			JP	62144033 A	27-06-1987
			DE	3640340 A1	27-05-1987
			DE	3645238 C2	07-11-1996
			GB	2186708 A ,B	19-08-1987
			GB	2217839 A ,B	01-11-1989